Satsop 2

To calculate the cooling tower PM10 emissions, need to know:

- the cooling tower recirculation rate
- cooling water TDS values
- cooling tower drift loss value to estimate the loss.

The Satsop EFSEC application contains a drift value of 0.001% of the recirculation flow in the cooling tower. This is reasonable, as the Wallula application uses a 0.0002% drift loss.

The cooling tower recirculation flow rate or design TDS value is not given in the Satsop application materials.

Alex had a PM10 emission rate for the cooling towers of 24.7 lb/hr each tower. This seems to have been based on a TDS value of about 6100 mg/l and a drift loss of 8 gpm.

Assuming 8 gpm as the drift loss and a drift loss value of 0.001% of the recirculation flow rate gives a recirculation flow through one cooling tower of 800,000 gallons per minute. This is an illogical value for one cooling tower, but not for 2 towers.

Using the 24.7 lb/hr value from Alex, and the 8 gpm drift loss rate calculates a cooling tower water containing 6116 mg/l TDS. The TDS value based on the application's cooling tower PM emission rate is 257 mg/l. The raw water supply is reported in the application to have 110 mg/l of TDS.

The Wallula project uses a cooling tower TDS of 11,000 mg/l and 168,000 gpm for the maximum recirculation rate per tower. This equates to a total PM emission rate of 1.85 lb/hr or 8.1 tpy. The application reports 1.8 lb/hr as the PM10 fraction of the PM, assuming PM10 is 70% of the PM.

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